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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/617,290	07/10/2003	Ralph H. Johnson	H26341-D1 US	2653

22913 7590 04/06/2005

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EXAMINER

MENEFEE, JAMES A

ART UNIT	PAPER NUMBER
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2828

DATE MAILED: 04/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/617,290	Applicant(s) JOHNSON ET AL.	
	Examiner James A. Menefee	Art Unit 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 32-53 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 32-53 is/are rejected.
- 7) ☒ Claim(s) 32,33,38 and 46 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>9/22/03 ; 9/24/03 ; 2/4/04</u> | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Response to Amendment

In response to the preliminary amendment, claims 1-31 are cancelled and claims 32-53 added, the specification is amended to reference the parent, and new drawing sheets have been received.

Drawings

The drawings were received on 11/17/2003. These drawings are acceptable.

Specification

The abstract of the disclosure is objected to because it is longer than 150 words. Correction is required. See MPEP § 608.01(b).

Claim Objections

Claims 32, 33, 38, 46, are objected to because of the following informalities: each of these claims include layers that are labeled as “insulting;” the offending layers should instead be “insulating.”

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 32 and 34-53 are rejected under 35 U.S.C. 102(b) as being anticipated by Cox (US 5,812,581). See Fig. 6 and the discussion thereof unless otherwise noted.

Regarding claim 32, Cox discloses a DBR TM comprising two or more layers, an insulating layer 60 defining an aperture (the portion between the sections 60 will be an aperture) and an isolation implant region 62 extending around and spaced outwardly from the perimeter of the aperture and traversing through the insulating layer and at least some of the DBR layers (indeed it goes through all of top mirror TM).

While Cox does not explicitly refer to the mirrors as DBRs, Cox refers to the mirrors, for example TM, as comprising a plurality of layers and with a structure as described in the cited patents in the background of the invention. See col. 6 lines 40-46. Several patents describe such mirrors as DBRs.

While the layer 60 is not explicitly referred to as “insulating,” its entire purpose is for gain guiding/current confinement, and therefore may be presumed as such.

Regarding claim 34, the isolation implant region 62 extends entirely around the perimeter of the aperture formed by insulating layer 60.

Regarding claims 35-36, the isolation implant region 62 defines an aperture larger than and substantially coaxial with the insulating layer aperture.

Regarding claim 37, the isolation implant region is implanted with hydrogen ions, therefore protons. Col. 7 lines 62-63.

Regarding claim 38, Cox discloses an optoelectronic device comprising first mirror TM, second mirror BM, active region A between the mirrors, insulating region 60 in the first mirror

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defining an aperture, an isolation implant region 62 extending around and spaced outwardly from at least part of the aperture of the insulating layer and traversing through the insulating layer and at least part of the first mirror TM.

Regarding claims 39-40, the isolation implant region 62 also traverses through the active region A and part of the bottom mirror BM.

Regarding claims 41-44, see the rejections of claims 34-37 above.

Regarding claim 45, Cox discloses the device as a VCSEL.

Regarding claims 46-53, these claims are merely methods comprising the steps of forming the devices as claimed in claims 38-45 respectively, and therefore are rejected for the same reasons.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cox in view of Choquette et al. (US 5,493,577).

Cox discloses the limitations of the claims as shown above. Cox does not disclose that the insulating layer 60 is interposed between selected layers of the DBR. Cox's insulating layer is ion implanted. However, Choquette teaches that such ion implanted layers may be advantageously replaced by an oxidized insulating layer 20. It would have been obvious to one

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skilled in the art to use an oxidized layer as in Choquette, rather than the ion implanted layer of Cox, because this improves device characteristics such as threshold current density. See Choquette col. 19 lines 8-21.

Choquette further teaches that it is advantageous to place such an oxidized insulating layer between selected mirror layers. See Fig. 3, with insulating layer 20 between selected mirror layers. It would have been obvious to one skilled in the art to position the insulating layer between selected DBR mirror layers for a number of advantageous reasons, as taught by Choquette in col. 16 lines 31-43.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The references show VCSELs with implanted regions and or oxidized insulating regions.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Menefee whose telephone number is (571) 272-1944. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MinSun Harvey can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'JMF', is positioned above the printed name and date.

James Menefee
March 24, 2005